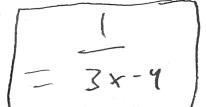**Chapter 5 Skill Refresher: Written Homework**   Name _Matt Lizak_

I expect quality solutions for these problems. You must show your work in order to receive credit. I am grading your work, not the answer! Be sure to write neatly, keep your work organized, and clearly indicate your final answer.

1. Perform the operations indicated and express your answers in reduced form.

   a.
   $$\frac{4x-3}{3x^2-x-4}-\frac{1}{x+1}=$$

$$\frac{4x-3}{3x^2+3x-4x-4} \qquad = \frac{4x-3-3x+4}{(x+1)(3x-4)}$$

$$= \frac{4x-3}{3x(x+1)-4(x+1)}-\frac{1}{x+1}$$

$$= \frac{4x-3}{(x+1)(3x-4)}-\frac{1}{x+1} \qquad = \frac{4x-3-3x+4}{(x+1)(3x-4)}$$

$$= \frac{4x-3-(3x-4)}{(x+1)(3x-4)} \qquad = \frac{x-3+4}{(x+1)(3x-4)}$$

$$= \frac{x+1}{(x+1)(3x-4)} \to \boxed{=\frac{1}{3x-4}}$$

   b.
   $$\frac{x}{x^2-9}+\frac{1}{x-3}=$$

$$\frac{x+x+3}{(x-3)(x+3)}$$

$$\frac{2x+3}{(x-3)(x+3)} \qquad = \boxed{\frac{2x+5}{x^2-9}}$$

$$= \frac{2x+5}{x^2-9}$$

c.

$$\frac{2x^2 + 8x - 10}{1 - \frac{1}{x}} =$$

$$= \frac{(2x^2 + 8x - 10) \cdot x}{x - 1}$$

$$= 2(x + 5)x$$

$$= \boxed{2x^2 + 10x}$$

$$= \frac{2(x^2 + 4x - 5)x}{x - 1}$$

$$= \frac{2(x(x+5) - x - 5)x}{x - 1}$$

$$\rightarrow \frac{2(x+5)(x-1)x}{x - 1}$$

d.

$$\frac{x-5}{x} \cdot \left(1 - \frac{5}{5-x}\right) =$$

$$= \frac{x-5}{x} \cdot \frac{5-x-5}{5-x}$$

$$= -(x-5) \cdot \frac{1}{-(x-5)}$$

$$= \frac{x-5}{x} \cdot \frac{-x}{5-x}$$

$$= -(-1)$$

$$= \frac{x-5}{x}\left(-\frac{x}{5-x}\right)$$

$$= \boxed{1}$$

$$= -\frac{x-5}{x}\left(\frac{x}{5-x}\right)$$